

Independent claim (one and only) of Japanese Kokai 5-220157

Title: Excision device for medical treatment

Excision device for medical treatment that is an excision device for medical treatment provided with a handpiece with internalized motor and a double layer tube comprised of an inside tube and an outside tube connected to this handpiece so as to be added and removed freely, whereby the aforementioned inside tube is connected to the aforementioned motor and is rotated inside the aforementioned outside tube by the spinning of the motor, and formed at the opening of the tip end sides of the aforementioned inside tube and outside tube, respectively, are openings outfitted with cutting blades to take in and cut the tissue to be cut off, and an inside hole in the aforementioned inside tube serves as a suction path, and characterized by a structure whereby there is provided on the handheld side of the aforementioned outside tube a water feed port to supply persulfate in the gap between the aforementioned outside tube and the aforementioned inside tube, and the tip of the inside hole of the aforementioned outside tube and the tip of the aforementioned inside tube are arranged separated and in the axial direction, and the persulfate supplied through this flow passage to the aforementioned gap is introduced to the suction path of the aforementioned inside pipe.

## EXCISION DEVICE FOR MEDICAL TREATMENT

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Requested Patent: ☐ JP5220157  
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IPC Classification: A61B17/32; A61B17/56  
EC Classification:  
Equivalents:

### Abstract

**PURPOSE:** To provide the excision device for medical treatment which can be easily washed and disinfected, efficiently cools an excision blade and can efficiently recover a perfusate into a suction path.

**CONSTITUTION:** This excision device has a handpiece contg. a motor and an outside pipe 11 and inside pipe 12 constituting double pipes freely attachable and detachable to the handpiece. The inside pipe 12 is rotated within the outside pipe 11 by the rotation of the motor. Apertures 14, 16 having the blades for taking in and cutting the tissues 17 to be incised are respectively formed in the front end side parts of the outside pipe 11 and the inside pipe 12. Further, the excision device for medical treatment formed with the inside hole of the inside pipe 12 as the suction path 7 is provided with a water feed port for supplying the perfusate to a spacing 18 between the outside pipe 11 and the inside pipe 12 on the operator side of the outside pipe 11. The front end of the inside hole of the outside pipe 11 and the front end of the inside pipe 12 are parted and disposed in the axial direction to form a flow passage 23 so that the perfusate supplied through this flow passage 23 to the spacing 18 is introduced into the suction path 7 of the inside pipe 12.

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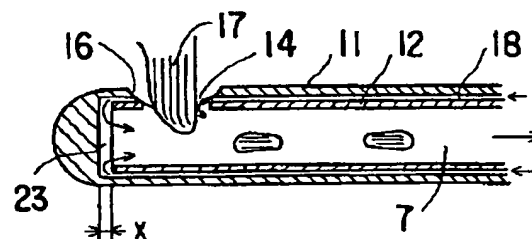
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(54) 【発明の名称】 医療用切除装置

(57) 【要約】

【目的】 洗浄や消毒が容易であり、切除刃を効率良く冷却し、灌流液を効率良く吸引路に回収できる医療用切除装置を提供すること。

【構成】 モータを内蔵したハンドピースと、ハンドピースに着脱自在の二重管を構成する外管11と内管12とを備え、内管12はモータの回転により外管11内で回転し、外管11及び内管12の先端側部に切除すべき組織17を取り込んで切断する刃を備えた開口14、16を各々形成し、内管12の内孔を吸引路7とした医療用切除装置において、外管11の手元側に外管11と内管12との隙間18に灌流液を供給する送水口を設けるとともに、外管11の内孔先端と内管12の先端とを軸方向に離間配置して流路23を形成し、この流路23を通して隙間18に供給される灌流液を内管12の吸引路7に導入するように構成した。



## 【特許請求の範囲】

【請求項1】 モータを内蔵したハンドピースと、このハンドピースに着脱自在に接続され、二重管を構成する外管と内管とを備え、前記内管は前記モータに接続され、モータの回転により前記外管内で回転し、前記外管及び内管の先端側部に切除すべき組織を取り込んで切断する刃を備えた開口を各々形成し、前記内管の内孔を吸引路とした医療用切除装置において、前記外管の手元側に前記外管と前記内管との隙間に灌流液を供給する送水口を設けるとともに、前記外管の内孔先端と前記内管の先端とを軸方向に離間配置して流路を形成し、この流路を通して前記隙間に供給される灌流液を前記内管の吸引路に導入するように構成したことを特徴とする医療用切除装置。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】 本発明は、例えば関節腔内の半月板、軟骨等の組織や椎間板内の髄核組織等を切除するための医療用切除装置に関する。

## 【0002】

【従来の技術】 従来、関節腔内の半月板、軟骨等の組織や椎間板内の髄核組織等を切除するための医療用切除装置が知られている。これらの医療用切除装置としては、実開平3-3314号及び特開昭50-15476号公報に示すように、ハンドピース内にモータを内蔵し、切除刃を回転駆動させるもの、特公平2-21814号公報に示すように、ハンドピース内にモータを内蔵し、そのモータの回転を切除刃の前後動に変換し、切除刃を前後動させるもの、特開昭61-92662号公報に示すように、空気圧により切除刃を前後動させるものなどが知られている。これらはいずれも内部に吸引路を有し、切除した組織片を吸引除去できるようになっている。

## 【0003】

【発明が解決しようとする課題】 ところで、上記実開平3-3314号公報に示す切除装置は送水路を有していないので、刃部の冷却及び組織片を効率良く吸引除去するための灌流液を流すことができないという問題がある。

【0004】 また、上記特公平2-21814号及び特開昭50-15476号公報に示す切除装置では、切除刃のさらに外周に外側管あるいはスリーブ組立体を被せ、それらと切除刃の間に環状空間を形成し送水するようにしている。しかし、挿入部が3重構造となるために外径が大きくなってしまふ。そのため、例えば椎間板内等の狭い部位に使用する場合、生体組織への侵襲が大きくなる。さらに、送水の出口がいずれも切除刃となる開口部と離れて設けられているので、送水を効率良く開口部から吸引路に回収できないという問題がある。

【0005】 一方、特開昭61-92662号公報に示す切除装置は、固定された針と、その中を前後動する管

状部材との間に灌流液を流す構造になっており、太さも細くでき、また、灌流液を効率良く吸引路に回収できる。しかし、針と管状部材で構成される挿入部がハンドピースに対して着脱できないので、吸引路等の洗浄、消毒ができず、使い捨て器具として使用せざるを得ないが、その場合、コストが高くなる。

【0006】 また、この装置では切除刃が前後動するように構成されているので、挿入部が僅かでも湾曲すると管状部材が前後動し難くなり、切除効率が低下する。さらに、前後動による切除方式では、半月板や軟骨等の比較的硬い組織を切除する場合、組織を取り込む開口部において、管状部材が針を曲げようとする力を発生するので、針が湾曲したり破損する等の危険性がある。

【0007】 本発明の目的は、洗浄や消毒が容易であり、外部からの負荷に強く、切除刃を効率良く冷却し、しかも、灌流液を効率良く吸引路に回収できる医療用切除装置を提供することにある。

## 【0008】

【課題を解決するための手段および作用】 本発明は、モータを内蔵したハンドピースと、このハンドピースに着脱自在に接続され、二重管を構成する外管と内管とを備え、前記内管は前記モータに接続され、モータの回転により前記外管内で回転し、前記外管及び内管の先端側部に切除すべき組織を取り込んで切断する刃を備えた開口を各々形成し、前記内管の内孔を吸引路とした医療用切除装置において、前記外管の手元側に前記外管と前記内管との隙間に灌流液を供給する送水口を設けるとともに、前記外管の内孔先端と前記内管の先端とを軸方向に離間配置して流路を形成し、この流路を通して前記隙間に供給される灌流液を前記内管の吸引路に導入するように構成したことを特徴としている。

【0009】 従って、切除刃を構成する外管と内管をハンドピースに対して着脱自在にしたので、切除刃をハンドピースから分離して洗浄や消毒が可能となり、また、外管と内管との隙間に灌流液が流れるため、内管の回転による摩擦熱が冷却されると共に、外管の内孔先端と内管の先端とを軸方向に離間配置して流路を形成したので、灌流液が流路を通して吸引路に常時効率良く流入して吸引回収される。

## 【0010】

【実施例】 以下図面を参照しながら本発明の実施例について説明する。

【0011】 図1から図3は、本発明の第1実施例に係わる医療用切除装置を示している。図1に示すように医療用切除装置1は、ハンドピース2とカッター（切除刃）3とを備えている。ハンドピース2内にはモータ4が内蔵され、このモータ4はケーブル6を介してコントロールユニット5に接続されている。また、カッター3内に設けられた吸引路は、吸引チューブ9を介して吸引圧を発生させる吸引装置8に接続されている。そして、

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コントロールユニット5にはフットスイッチ10が接続されている。

【0012】図2及び図3に示すように、カッター3は外管11と内管12の2重管構造に構成されている。内管12の手元部には、ハンドピース2に着脱自在に接続できる接続部13が設けられ、この接続部13にはハンドピース2内のモータ4の回転が伝達されて内管12を回転させるようになっている。また、接続部13には吸引口15が形成され、この吸引口15は、内管12の先端部の側面に形成された開口14と、内管12の全長にわたり形成された吸引路7と連通し、さらにハンドピース2内に設けられた吸引路（図示せず）と、外部の吸引装置8とに連通する。

【0013】一方、外管11の先端は、安全性を高めるために球状に形成され、外管11の側面には、内管12の開口14と長手方向の同位置に開口16が形成されている。外管11の開口16及び内管12の開口14には、それらの縁部に各々刃が形成され、内管12の回転運動によりこれらの刃が共働して、開口14、16に吸引して取り込んだ組織17を小さな組織片に切断するように構成されている。

【0014】さらに、外管11と内管12のほぼ全長にわたって、灌流液を流す環状の隙間が形成され、この隙間が送水路18を構成している。また、外管11の手元側には連結部材19が設けられ、内管12が外管11に対して液密状態で回転可能となるように連結されている。この連結部材19には送水口22が設けられ、この送水口22は、送水チューブ21を介して外部の送水ボトル20に接続され、送水ボトル20内に収容された灌流液が送水チューブ21、送水口22、及び送水路18を介してカッター3の先端部に供給される。

【0015】また、図3に示すように、外管11の内孔先端と内管12の先端は軸方向にxだけ離れており、外管11と内管12の接触を防止し、内管12を滑らかに回転させるとともに、送水路18を流れる灌流液が常時吸引路7に流れ込むようにするための流路23が形成されている。次に、上記第1実施例に係わる医療用切除装置の動作について説明する。

【0016】使用時には、まずハンドピース2にカッター3を装着し、ハンドピース2内のモータ4とカッター3の内管12とを連結する。そして、操作スイッチ10を操作してモータ4を駆動すると、モータ4の回転が内管12に伝達される。そして、開口14、16から切除すべき組織を吸引装置8の作動による吸引によって取り込むと、内管12の回転により開口14、16に設けられた刃によって組織が切断される。切断された組織片は、吸引路7、吸引口15、吸引チューブ9を経て外部の吸引装置8に吸引、除去される。

【0017】組織の切除と同時に送水ボトル20内の灌流液は、送水チューブ21、送水口22を経て送水路1

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8に流入し、さらに流路23を経て吸引路7に吸引される。従って、吸引路7内に吸引される灌流液の流れに乗って、切断された組織片が確実に吸引除去される。切除装置の使用後は、カッター3をハンドピース2から外し、その後外管11と内管12を分解し、吸引路7等を洗浄・消毒すれば良い。

【0018】このように構成された医療用切除装置では、カッターが外管と内管の2重構造であるため、カッターの細径化が可能であり、椎間板等の狭い部位へも低侵襲で挿入できる。また、外管と内管との間の環状空間を送水液が流れるため、回転による摩擦熱によりカッターが熱くなるのを効果的に冷却できる。

【0019】また、外管先端と内管先端との間に流路を設けることにより、灌流液が送水路から吸引路に常時効率良く流入し、灌流液を効率良く吸引回収できる。そして、ハンドピースに対してカッターが着脱自在であるため、使用後の洗浄・消毒が容易に行なえる。

【0020】さらに、組織片が吸引路内につまった場合には、使用中でもカッターをハンドピースから取り外すことにより、組織片を容易に除去でき、手術を長時間中断することがない。また、内管の回転により組織を切断するため、カッターを前後動させる方式のものに比べ、外部からの負荷に強く、半月板、軟骨等比較的硬い組織の切除においても先端開口部が破損することがなく、安全に切除を行うことができる。次に、図4を参照しながら本発明の第2実施例について説明する。この第2実施例は、ハンドピース内の吸引路をストレートに形成したものである。

【0021】図4に示すようにハンドピース24には、側方に延出するグリップ部26が設けられ、グリップ部26内にモータ27が内蔵されている。そして、モータ27の回転軸27aには歯車28が固着されている。

【0022】また、第1実施例と同様にカッター25内に設けられた吸引路と連通する吸引路29がハンドピース24内に設けられると共に、カッター25の内管（図示せず）に回転を伝達する回転部材30が設けられている。そして、歯車28と噛合して回転部材30を回転させる歯車31が回転部材30に固着されている。さらに、ハンドピース24の後端には、外部の吸引装置（図示せず）に連通する吸引チューブ（図示せず）を接続するための吸引口金32が突出して設けられている。なお、Oリング34、35は、モータ27の回転軸27a及び回転部材30の軸受及び水密部材として設けられている。その他の構成は第1実施例と同様である。

【0023】この第2実施例では、第1実施例の効果に加えて、吸引路29がカッター25から吸引口金32までストレート形状に形成されているので、吸引路内での組織片のつまりを防止できる。次に、図5を参照しながら本発明の第3実施例について説明する。

【0024】本実施例は、カッター36を生体内に挿入

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 するための外套管37をカッター36の外周上に設け、この外套管37とハンドピース38の先端部との間にバネ等の弾性部材39を設けたものである。

【0025】上記外套管37には、カッター36と外套管37の内腔との隙間を通して灌流液を送水するための送水口40と、外套管37の手元側からの水もれを防止するゴムキャップ等の水密部材41が設けられている。

【0026】この第3実施例では図5(a)に示すように、外套管37に対してカッター36を弾性部材39が水密部材41に当接するまで挿入する。この状態でカッター36の先端は、外套管37の先端から突出しない。次に、図5(b)に示すように、弾性部材39の弾性力に抗してカッター36を押し込むと、カッター36の先端が外套管37の先端から突出し、生体組織を切除できるようになる。そして、カッター36を押し込んでいる力を弱めると、弾性部材39の弾性力により図5(a)の状態に戻る。

【0027】つまり、この動作を繰り返すことにより、図5(b)の状態では組織を切除し、図5(a)の状態では外套管37の送水口40から送水した灌流液をカッター36先端の開口42から吸引することができる。その他の構成は第1実施例と同様である。

【0028】この第3実施例では、第1実施例の効果に加えて、外套管の送水口から流れる灌流液と一緒に組織片を吸引できるため、組織片が吸引路の途中で詰まることなく効率良く吸引できる。

【0029】

【発明の効果】以上説明したように本発明の医療用切除装置では、切除刃が外管と内管の2重構造であるため、切除刃の細径化が可能であり、椎間板等の狭い部位へも低侵襲で挿入できる。また、外管と内管との間の環状空

間を送水液が流れるため、回転による摩擦熱により切除刃が熱くなるのを効果的に冷却できる。

【0030】また、外管先端と内管先端との間に流路を設けることにより、灌流液が送水路から吸引路に常時効率良く流入し、灌流液を効率良く吸引回収できる。そして、ハンドピースに対して切除刃が着脱自在であるため、使用後の洗浄・消毒が容易に行なえる。

【0031】さらに、組織片が吸引路内につまった場合には、使用中でも切除刃をハンドピースから取り外すことにより、組織片を容易に除去でき、手術を長時間中断することがない。また、内管の回転により組織を切断するため、切除刃を前後動させる方式のものに比べ、外部からの負荷に強く、半月板、軟骨等比較的硬い組織の切除においても先端開口部が破損することがなく、安全に切除を行うことができる。

【図面の簡単な説明】

【図1】本発明の第1実施例に係わる医療用切除装置の全体構成図である。

【図2】図1に示すカッターの全体図である。

【図3】上記カッターの断面図である。

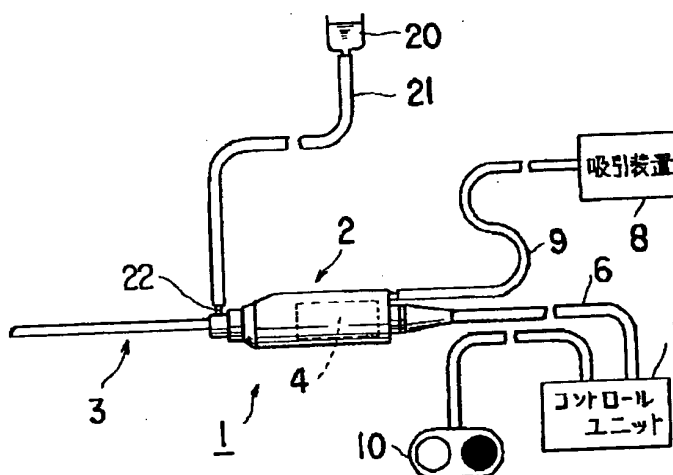
【図4】本発明の第2実施例に係わる医療用切除装置の部分断面図である。

【図5】(a)は本発明の第3実施例に係わる医療用切除装置の全体構成図、(b)はカッターの使用状態を示す部分図である。

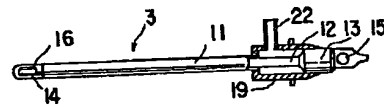
【符号の説明】

1…医療用切除装置、2…ハンドピース、3…カッター、4…モータ、7…吸引路、11…外管、12…内管、14、16…開口、18…送水路、22…送水口、23…流路。

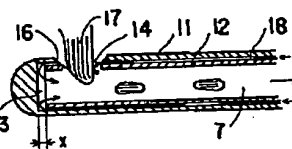
【図1】



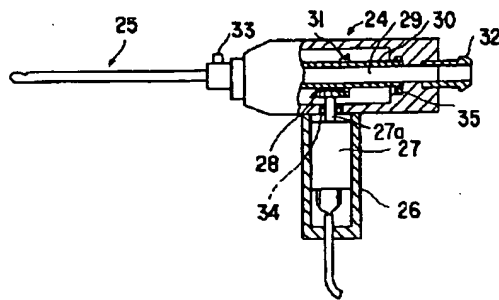
【図2】



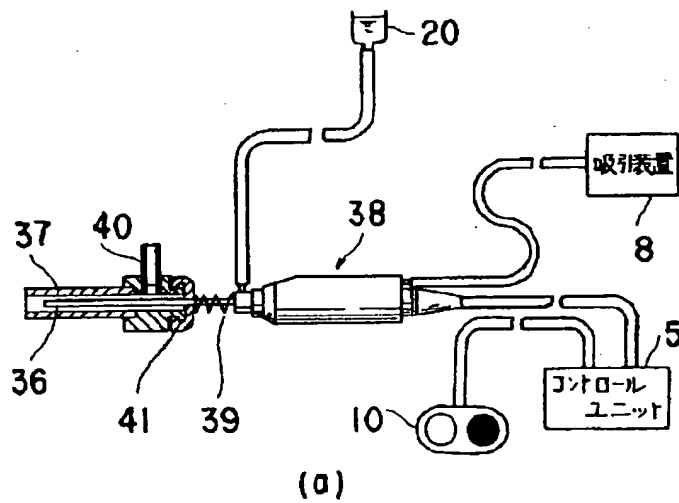
【図3】



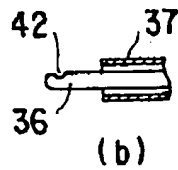
【図4】



【図5】



(a)



(b)

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## CLAIMS

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### [Claim(s)]

[Claim 1] It connects with the handpiece which carried out the internal organs of the motor, and this handpiece free [ attachment and detachment ]. Have the outer tube and inner tube which constitute a double pipe, and said inner tube is connected to said motor. In the medical-application excision equipment which rotated within said outer tube by rotation of a motor, formed respectively opening equipped with the cutting edge which incorporates and cuts the organization which should excise to the tip flank of said outer tube and an inner tube, and made the inner hole of said inner tube the suction way While preparing water supply opening which supplies perfusate in the clearance between said outer tubes and said inner tubes at the hand side of said outer tube the inner hole tip of said outer tube, and the tip of said inner tube -- shaft orientations -- alienation -- the medical-application excision equipment characterized by constituting so that the perfusate which arranges, forms passage and is supplied to said clearance through this passage may be introduced into the suction way of said inner tube.

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## DETAILED DESCRIPTION

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### [Detailed Description of the Invention]

#### [0001]

[Industrial Application] This invention relates to the medical-application excision equipment for excising the organization of the meniscus for example, in the cavum articulare, a cartilage, etc., the vertebral-pulp organization in an intervertebral disk, etc.

#### [0002]

[Description of the Prior Art] The medical-application excision equipment for excising the organization of the meniscus in the cavum articulare, a cartilage, etc., the vertebral-pulp organization in an intervertebral disk, etc. conventionally is known. As the internal organs of the motor are carried out into the handpiece, and rotation of the motor is changed into the longitudinal slide movement of an excision cutting edge, as shown in the thing and JP,2-21814,B which the internal organs of the motor are carried out [ JP,2-21814,B ] into the handpiece as shown in JP,3-3314,U and JP,50-15476,A as these medical-application excision equipments, and carry out the rotation drive of the excision cutting edge, and shown in the thing and JP,61-92662,A to which longitudinal slide movement of the excision cutting edge is carried out, that to which longitudinal slide movement of the excision cutting edge is carried out with pneumatic pressure is known. Each of these has a suction way inside, and has come to be able to carry out suction removal of the excised explant.

#### [0003]

[Problem(s) to be Solved by the Invention] By the way, since the excision equipment

shown in above-mentioned JP,3-3314,U does not have the aqueduct, it has the problem that the perfusate for carrying out suction removal of cooling and the explant of a cutting part efficiently cannot be passed.

[0004] Moreover, outside tubing or a sleeve assembly is put on the pan of an excision cutting edge at a periphery, and he forms annular space and is trying to supply water between them and an excision cutting edge with the excision equipment shown in above-mentioned JP,2-21814,B and JP,50-15476,A. However, since the insertion section serves as 3-fold structure, an outer diameter will become thick. Therefore, when using it, for example for the narrow parts in an intervertebral disk etc., the invasion to a body tissue becomes large. Furthermore, since each outlet of water supply separates with opening used as an excision cutting edge and is prepared, there is a problem that water supply is efficiently unrecoverable from opening on a suction way.

[0005] On the other hand, the excision equipment shown in JP,61-92662,A has the structure of passing perfusate between the fixed needle and the tubular member which carries out longitudinal slide movement of the inside of it, and can also make a size thin, and can collect perfusate on a suction way efficiently. However, although washing of a suction way etc. and disinfection cannot be performed but it must be used as a disposable instrument since the insertion section which consists of a needle and a tubular member cannot detach and attach to the handpiece, cost becomes high in that case.

[0006] Moreover, since it consists of this equipment so that an excision cutting edge may carry out longitudinal slide movement, if it curves even when the insertion section is slight, it will be hard coming to carry out longitudinal slide movement of the tubular member, and excision effectiveness will fall. Furthermore, by the excision method by longitudinal slide movement, since the force in which a tubular member tends to bend a needle is generated in opening which incorporates an organization when excising the comparatively hard organization of a meniscus, a cartilage, etc., a needle curves or there is danger of damaging.

[0007] Washing and disinfection are easy, are strong for a load from the outside, and cool an excision cutting edge efficiently, and the purpose of this invention has them in moreover offering the medical-application excision equipment which can collect perfusate on a suction way efficiently.

[0008]

[Means for Solving the Problem and its Function] This invention is connected to the handpiece which carried out the internal organs of the motor, and this handpiece free [ attachment and detachment ]. Have the outer tube and inner tube which constitute a double pipe, and said inner tube is connected to said motor. In the medical-application excision equipment which rotated within said outer tube by rotation of a motor, formed respectively opening equipped with the cutting edge which incorporates and cuts the organization which should excise to the tip flank of said outer tube and an inner tube, and made the inner hole of said inner tube the suction way While preparing water supply opening which supplies perfusate in the clearance between said outer tubes and said inner tubes at the hand side of said outer tube the inner hole tip of said outer tube, and the tip of said inner tube -- shaft orientations -- alienation -- it arranges, passage is formed and it is characterized by constituting so that the perfusate supplied to said clearance through this passage may be introduced into the suction way of said inner

tube.

[0009] Therefore, since attachment and detachment of the outer tube and inner tube which constitute an excision cutting edge were enabled to the handpiece Since an excision cutting edge is separated from the handpiece, and washing and disinfection are attained and perfusate flows in the clearance between an outer tube and an inner tube, while the frictional heat by rotation of an inner tube is cooled the inner hole tip of an outer tube, and the tip of an inner tube – shaft orientations – alienation -- since it has arranged and passage was formed, through passage, perfusate always flows into a suction way efficiently, and suction recovery is carried out.

[0010]

[Example] The example of this invention is explained referring to a drawing below.

[0011] Drawing 3 shows the medical-application excision equipment concerning the 1st example of this invention from drawing 1 . As shown in drawing 1 , medical-application excision equipment 1 is equipped with the handpiece 2 and a cutter (excision cutting edge) 3. The internal organs of the motor 4 are carried out into the handpiece 2, and this motor 4 is connected to the control unit 5 through the cable 6. Moreover, the suction way prepared in the cutter 3 is connected to the aspirator 8 made to generate suction force through the suction tube 9. And the foot switch 10 is connected to the control unit 5.

[0012] The cutter 3 is constituted by the double tubing structure of an outer tube 11 and an inner tube 12 as shown in drawing 2 and drawing 3 . The connection 13 connectable with the handpiece 2 free [ attachment and detachment ] is formed, rotation of the motor 4 in the handpiece 2 is transmitted to this connection 13, and the hand section of an inner tube 12 is made to rotate an inner tube 12. Moreover, the suction opening 15 is formed in a connection 13, and this suction opening 15 is open for free passage with the opening 14 formed in the side face of the point of an inner tube 12, and the suction way 7 formed covering the overall length of an inner tube 12, and further open for free passage to a \*\*\*\*\* suction way (not shown) and the external aspirator 8 in the handpiece 2.

[0013] On the other hand, in order that the tip of an outer tube 11 may raise safety, it is formed spherically, and opening 16 is formed in the side face of an outer tube 11 in the opening 14 of an inner tube 12, and the homotopic of a longitudinal direction. In the opening 16 of an outer tube 11, and the opening 14 of an inner tube 12, a cutting edge is respectively formed in those edges, and these cutting edges have two incomes in rotation of an inner tube 12, and it is constituted so that the organization 17 which drew in and was in confusion to openings 14 and 16 may be cut to a small explant.

[0014] Furthermore, mostly, covering an overall length, the annular clearance between an outer tube 11 and an inner tube 12 which passes perfusate is formed, and this clearance constitutes the aqueduct 18. Moreover, the connection member 19 is formed in the hand side of an outer tube 11, and it is connected so that an inner tube 12 may become pivotable in the state of fluid-tight to an outer tube 11. The water supply opening 22 is formed in this connection member 19, this water supply opening 22 is connected to the external water supply bottle 20 through the water supply tube 21, and the perfusate held in the water supply bottle 20 is supplied to the point of a cutter 3 through the water supply tube 21, the water supply opening 22, and an aqueduct 18.

[0015] Moreover, as shown in drawing 3 , while it is separated from the inner hole tip of

an outer tube 11, and the tip of an inner tube 12 of x to shaft orientations, preventing contact of an outer tube 11 and an inner tube 12 and rotating an inner tube 12 smoothly, the passage 23 for making it the perfusate which flows an aqueduct 18 always flow into the suction way 7 is formed. Next, actuation of the medical-application excision equipment concerning the 1st example of the above is explained.

[0016] At the time of use, the handpiece 2 is first equipped with a cutter 3, and the motor 4 in the handpiece 2 and the inner tube 12 of a cutter 3 are connected. And if the actuation switch 10 is operated and a motor 4 is driven, rotation of a motor 4 will be transmitted to an inner tube 12. And an organization will be cut by the cutting edge formed in openings 14 and 16 by rotation of an inner tube 12 if the organization which should excise from openings 14 and 16 is incorporated by suction by actuation of an aspirator 8. The cut explant passes through the suction way 7, the suction opening 15, and the suction tube 9, is attracted by the external aspirator 8 and removed.

[0017] The perfusate in the water supply bottle 20 flows into excision and coincidence of an organization through the water supply tube 21 and the water supply opening 22 in an aqueduct 18, and is further attracted through passage 23 on the suction way 7.

Therefore, the flow of the perfusate attracted in the suction way 7 is ridden, and suction removal of the cut explant is carried out certainly. After use of excision equipment removes a cutter 3 from the handpiece 2, disassembles an outer tube 11 and an inner tube 12 after that, and should just wash and disinfect suction way 7 grade.

[0018] Thus, with the constituted medical-application excision equipment, since a cutter is the double structure of an outer tube and an inner tube, narrow-diameter-izing of a cutter is possible and it can insert also in narrow parts, such as an intervertebral disk, by low invasion. Moreover, since water supply liquid flows the annular space between an outer tube and an inner tube, it can cool effectively that a cutter gets hot with the frictional heat by rotation.

[0019] Moreover, by preparing passage between an outer-tube tip and an inner-tube tip, perfusate always flows into a suction way efficiently from an aqueduct, and can carry out suction recovery of the perfusate efficiently. And to the handpiece, since a cutter can detach and attach freely, washing and disinfection after use can be performed easily.

[0020] Furthermore, when an explant is got blocked in a suction way, by removing a cutter from the handpiece also in use, an explant can be removed easily and long duration interruption of the operation is not carried out. Moreover, since rotation of an inner tube cuts an organization, compared with the thing of the method to which longitudinal slide movement of the cutter is carried out, it can be strong for a load from the outside, tip opening cannot be damaged in excision of comparatively hard organizations, such as a meniscus and a cartilage, and it can excise safely. Next, the 2nd example of this invention is explained, referring to drawing 4. This 2nd example forms the suction way in the handpiece straight.

[0021] As shown in drawing 4, the grip section 26 which extends to the side is formed in the handpiece 24, and the internal organs of the motor 27 are carried out into the grip section 26. And the gearing 28 has fixed to revolving-shaft 27a of a motor 27.

[0022] Moreover, while the suction way prepared in the cutter 25 like the 1st example and the suction way 29 open for free passage are formed in the handpiece 24, the rotation member 30 which transmits rotation to the inner tube (not shown) of a cutter 25

is formed. And the gearing 31 which it gears [ gearing ] with a gearing 28 and rotates the rotation member 30 has fixed to the rotation member 30. furthermore, suction for connecting to the back end of the handpiece 24 the suction tube (not shown) which is open for free passage to an external aspirator (not shown) – a mouthpiece 32 projects and is prepared. In addition, O rings 34 and 35 are formed as the bearing of revolving-shaft 27a of a motor 27, and the rotation member 30, and a watertight member. Other configurations are the same as that of the 1st example.

[0023] this 2nd example -- the effectiveness of the 1st example -- in addition, the suction way 29 -- suction from a cutter 25 -- since even the mouthpiece 32 is formed in the straight configuration, \*\*\*\*\* of the explant in a suction way can be prevented. Next, the 3rd example of this invention is explained, referring to drawing 5 .

[0024] This example forms the mantle tubing 37 for inserting a cutter 36 in the living body on the periphery of a cutter 36, and forms the elastic members 39, such as a spring, between this mantle tubing 37 and the point of the handpiece 38.

[0025] The water supply opening 40 for supplying water in perfusate through the clearance between a cutter 36 and the lumen of the mantle tubing 37 and the watertight members 41, such as a rubber screen which prevents the water leak from the hand side of the mantle tubing 37, are formed in the above-mentioned mantle tubing 37.

[0026] In this 3rd example, as shown in drawing 5 (a), it inserts until an elastic member 39 contacts the watertight member 41 in a cutter 36 to the mantle tubing 37. The tip of a cutter 36 does not project from the tip of the mantle tubing 37 in this condition. Next, if the elastic force of an elastic member 39 is resisted and a cutter 36 is pushed in as shown in drawing 5 (b), the tip of a cutter 36 can excise a projection and a body tissue from the tip of the mantle tubing 37. And if the force which is pushing in the cutter 36 is weakened, it will return to the condition of drawing 5 (a) according to the elastic force of an elastic member 39.

[0027] That is, by repeating this actuation, an organization can be excised in the state of drawing 5 (b), and the perfusate which supplied water from the water supply opening 40 of the mantle tubing 37 in the state of drawing 5 (a) can be attracted from the opening 42 at cutter 36 tip. Other configurations are the same as that of the 1st example.

[0028] this 3rd example -- the effectiveness of the 1st example -- in addition, since an explant can be attracted together with the perfusate which flows from water supply opening of mantle tubing, an explant is a suction way -- on the way -- it comes out, and it can draw in efficiently, without getting it blocked.

[0029]

[Effect of the Invention] With the medical-application excision equipment of this invention, as explained above, since an excision cutting edge is the double structure of an outer tube and an inner tube, narrow-diameter-izing of an excision cutting edge is possible, and it can insert also in narrow parts, such as an intervertebral disk, by low invasion. Moreover, since water supply liquid flows the annular space between an outer tube and an inner tube, it can cool effectively that an excision cutting edge gets hot with the frictional heat by rotation.

[0030] Moreover, by preparing passage between an outer-tube tip and an inner-tube tip, perfusate always flows into a suction way efficiently from an aqueduct, and can carry out suction recovery of the perfusate efficiently. And to the handpiece, since an excision cutting edge can detach and attach freely, washing and disinfection after use can be

performed easily.

[0031] Furthermore, when an explant is got blocked in a suction way, by removing an excision cutting edge from the handpiece also in use, an explant can be removed easily and long duration interruption of the operation is not carried out. Moreover, since rotation of an inner tube cuts an organization, compared with the thing of the method to which longitudinal slide movement of the excision cutting edge is carried out, it can be strong for a load from the outside, tip opening cannot be damaged in excision of comparatively hard organizations, such as a meniscus and a cartilage, and it can excise safely.

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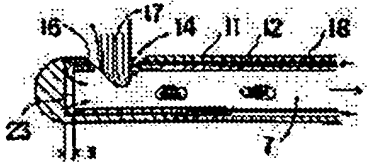
(21)Application number : **04-030625** (71)Applicant : **OLYMPUS OPTICAL CO LTD**  
(22)Date of filing : **18.02.1992** (72)Inventor : **KUBOTA TETSUMARU**

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(54) **EXCISION DEVICE FOR MEDICAL TREATMENT**

(57)Abstract:

**PURPOSE:** To provide the excision device for medical treatment which can be easily washed and disinfected, efficiently cools an excision blade and can efficiently recover a perfusate into a suction path.



**CONSTITUTION:** This excision device has a handpiece contg. a motor and an outside pipe 11 and inside pipe 12 constituting double pipes freely attachable and detachable to the handpiece. The inside pipe 12 is rotated within the outside pipe 11 by the rotation of the motor. Apertures 14, 16 having the blades for taking in and cutting the tissues 17 to be incised are respectively formed in the front end side parts of the outside pipe 11 and the inside pipe 12. Further, the excision device for medical treatment formed with the inside hole of the inside pipe 12 as the suction path 7 is provided with a water feed port for supplying the perfusate to a spacing 18 between the outside pipe 11 and the

inside pipe 12 on the operator side of the outside pipe 11. The front end of the inside hole of the outside pipe 11 and the front end of the inside pipe 12 are parted and disposed in the axial direction to form a flow passage 23 so that the perfusate supplied through this flow passage 23 to the spacing 18 is introduced into the suction path 7 of the inside pipe 12.

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